Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:

Jianbo Lu

Group Art Unit: 3661

Serial Number: 10/708,681

Examiner: Gibson, Eric M.

Filed: 03/18/2004

For: METHOD AND APPARATUS FOR CONTROLLING A VEHICLE USING AN OBJECT DETECTION SYSTEM AND BRAKE-STEER

Attorney Docket No: 81095831 (FGT 1913 PA)

CERTIFICATE OF MAILING/TRANSMISSION

I hereby certify that this correspondence is, on the date shown below, being filed electronically through EFS-Web of the United States Patent and Trademark Office.

Donna Kraft
Signature

Date: 9-6-2006

Donna Kraft

BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

The following Appeal Brief is submitted pursuant to the Notice of Appeal dated July 7, 2006, for the above-identified application.

I. Real Party in Interest

The real party in interest in this matter is Ford Global Technologies, LLC, which is a wholly owned subsidiary of Ford Motor Company both in Dearborn, Michigan (hereinafter "Ford").

II. Related Appeals and Interferences

There are no other known appeals or interferences which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of the Claims

Claims 1-30 are pending in the application. Claims 1-30 stand rejected. The rejection of each claim is being appealed.

IV. Status of Amendments

There have been no Amendments filed after the final rejection.

V. Summary of Claimed Subject Matter

Independent Claim 1 is best understood with reference to paragraph 136 of Appellants' specification at lines 1-17, and further with reference to Appellants' Figure 22. Claim 1 recites a control system for an automotive vehicle including an object detection system that generates an object detection signal and an object distance signal. A controller is coupled to the object detection system and is programmed to generate a brake-steer signal proportional to the object distance signal in response to the object detection signal and the object distance signal. The controller is also programmed to control the vehicle in response to a brake-steer signal.

Independent Claim 8 is best understood with reference to paragraph 136 of Appellants' specification at lines 1-17, and further with reference to Appellants' Figure 22. Claim 8 is similar to independent Claim 1, but contains the limitation that the system controller is programmed to generate a brake control signal proportional to the object distance signal in response to the object detection signal and object distance signal. The controller operates the brake system in response to the brake control signal.

Independent Claim 20 is a method claim analogue to the system claimed in independent Claim 1. Thus, the method is best understood with respect to Figure 22 and paragraph 136 at lines 1-17 of Appellants' specification. As set forth in Claim 20, the method includes generating

an object detection signal and an object distance signal in response to an object. Then, a brake-steer signal is generated which is proportional to the object distance signal in response to the object detection signal and the object distance signal. Then, brake-steer is applied in response to the brake-steer signal to attempt to avoid the object.

Independent Claim 27 is a method analogue to independent Claim 8. Claim 27 is best understood with respect to Figure 22 and paragraph 136 at lines 1-17 of Appellants' specification. Claim 27 sets forth the generation of a brake control signal followed by controlling the brake system in response to the brake control signal and a supplemental brake signal which *is generated in response to the previously described object position signal.*

VI. Grounds of Rejection to be Reviewed on Appeal

The following issue is presented in this appeal:

Are Claims 1-30 properly rejected under 35 U.S.C. §102 as being anticipated by Matsuno (US2001/0020217)?

VII. Argument

Claims 1-30 are not properly rejected under 35 U.S.C. §102 as being anticipated by Matsuno (US2001/0020217).

Claim 1

Matsuno discloses an object detection system which helps the vehicle to avoid an obstacle and to determine a yaw rate required for turning around an obstacle. A brake control is discussed in Matsuno at paragraph 49, as well as at paragraph 51. In his calculation of brake control, Matsuno uses target yaw rate γ_t, which is the larger of a first and second yaw rate γ_1 and γ_2. In turn, γ_1 is *calculated without reference to the distance* L_x *from* the vehicle to an obstacle. The reader's attention is focused upon Matsuno's Equation (4).

Moreover, γ_2, which is calculated according to Matsuno's Equation (5), does not use distance either. As a result, the Examiner is in error with his contention that the brakes of Matsuno's vehicle are controlled according to the distance sensed from an object. Moreover, it is doubly clear that Matsuno's system does not control brake-steer in proportion to an object distance signal. As a result, Claim 1 cannot be rejected on the basis of Matusuno, and the Examiner should be reversed.

Claim 8

Claim 8, the second independent claim, sets forth a system where a controller is programmed to generate a brake control signal proportional to the object distance signal. As fully explained above, Matsuno does not control brakes in proportion to an object distance signal and Claim 8, too should be passed to issue notwithstanding the Examiner's rejection.

Claim 20

According to Claim 20, a brake-steer signal is generated according to a method in which the brake-steer signal is proportional to an object distance signal. As fully described above, Claim 20 cannot be rejected over Matsuno and reversal of the Examiner's rejection is proper.

Claim 27

Claim 27 includes the limitation that a brake control signal is generated which is proportional to the object distance signal and Claim 27 is allowable for the reasons stated above regarding Claims 1, 8, and 20.

Claims 2-7

Claims 2-7 depend from Claim 1, and each is allowable for the reasons stated above with reference to Claim 1.

Claims 9-19

Claims 9-19 depend from Claim 8, and each is allowable for the reasons stated above with reference to Claim 8.

Claims 21-26

Claims 21-26 depend from Claim 20, and each is allowable for the reasons stated above with reference to Claim 20.

Claims 28-30

Claims 28-30 depend from Claim 27, and each is allowable for the reasons stated above with reference to Claim 27.

VIII. Claims Appendix

A copy of each of the claims involved in this appeal, namely Claims 1-30 is attached as a Claims Appendix.

IX. Evidence Appendix

None.

X. Related Proceedings Appendix

None.

XI. Conclusion

For the foregoing reasons, Appellants respectfully request that the Board direct the Examiner in charge of this examination to withdraw the rejections.

Please charge any fees required in the filing of this appeal to deposit account 06-1510.

Respectfully submitted,

Jerome R. Drouillard
Registration No. 28,008
28333 Telegraph Road, Suite 250
Southfield, MI 48034
(248) 223-9500

Date: 9/06/06

CLAIMS APPENDIX

1. A control system for an automotive vehicle having a brake system comprising:

an object detection system generating an object detection signal and an object distance signal; and

a controller coupled to the object detection system, said controller programmed to generate a brake-steer signal proportional to the object distance signal in response to the object detection signal and the object distance signal and control the vehicle in response to the brake-steer signal.

2. A control system as recited in claim 1 wherein said controller determines a direction change in response to the object signal.

3. A control system as recited in claim 2 wherein said controller controls a first brake to control the vehicle toward the direction change.

4. A control system as recited in claim 1 wherein the object detection system comprises a radar.

5. A control system as recited in claim 1 wherein the object detection system comprises a sonar.

6. A control system as recited in claim 1 wherein the object detection system comprises a lidar.

7. A control system as recited in claim 1 wherein the object detection system comprises a camera.

8. A control system for an automotive vehicle having a brake system comprising:

an object detection system generating an object detection signal and an object distance signal; and

a controller coupled to the object detection system, said controller programmed to generate a brake control signal proportional to object distance signal in response to the object detection signal and the object distance signal, and control the brake system in response to the brake control signal.

9. A control system as recited in claim 8 wherein the brake control signal comprises a first brake control signal, a second brake control signal, a third brake control signal and a fourth brake control signal.

10. A control system as recited in claim 8 wherein said controller determines a direction change in response to the object signal.

11. A control system as recited in claim 10 wherein said controller controls a first brake to control the vehicle toward the direction change.

12. A control system as recited in claim 8 wherein the object detection system comprises a radar.

13. A control system as recited in claim 8 wherein the object detection system comprises a sonar.

14. A control system as recited in claim 8 wherein the object detection system comprises a lidar.

15. A control system as recited in claim 8 wherein the object detection system comprises a camera.

16. A control system as recited in claim 8 wherein said controller is programmed to control the brake system by applying brake-steer.

17. A system as recited in claim 16 wherein said controller is programmed to brake-steer by applying a first brake and a second brake to reduce the turning radius of the vehicle.

18. A system as recited in claim 16 wherein said controller is programmed to brake-steer by applying at least one brake at a first wheel to reduce a vehicle turning radius.

19. A system as recited in claim 16 wherein said controller is programmed to brake-steer by applying an increased drive torque to a second wheel relative to the first wheel.

20. A method of controlling an automotive vehicle having a brake system comprising:

generating an object detection signal and an object distance signal in response to an object;

generating a brake-steer signal proportional to object distance signal in response to the object detection signal and the object distance signal; and

applying brake-steer to the vehicle in response to the brake-steer signal to attempt to avoid the object.

21. A method as recited in claim 20 wherein generating an object detection signal comprises generating an object signal in response to a sonar, radar or lidar.

22. A method as recited in claim 20 wherein generating an object detection signal comprises generating an object signal from a camera.

23. A method as recited in claim 20 wherein applying brake-steer comprises applying at least one brake at a first wheel to reduce a vehicle turning radius.

24. A method as recited in claim 20 wherein applying brake-steer comprises applying an increased drive torque to a second wheel relative to a first wheel.

25. A method as recited in claim 20 applying brake-steer comprises increasing the normal load on a rear wheel.

26. A method as recited in claim 20 applying brake-steer comprises increasing the normal load on a front wheel.

27. A method of controlling an automotive vehicle having a brake system having a plurality of brakes comprising:

generating an object position signal and an object distance signal;

generating a brake control signal proportional to the object distance signal in response to the object position signal and the object distance signal;

generating a supplemental brake signal in response to the object position signal for at least one of the plurality of brakes to generate brake-steer for the vehicle; and

controlling the brake system in response to the brake control signal and the supplemental brake signal.

28. A method as recited in claim 27 wherein generating an object position signal comprises generating an object signal in response to a sonar, radar or lidar.

29. A method as recited in claim 27 wherein generating an object position signal comprises generating an object signal in response to a camera.

30. A method as recited in claim 27 wherein generating a supplemental brake signal comprises generating a supplemental brake signal in response to a yaw rate.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.